8 GAT-823-78-23, Preparations for Processing TRU Bearing Materials

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Gentlemen:

PREPARATIONS FOR PROCESSING TRANSURANIC BEARING MATERIAL AT X-705 OXIDE CONVERSION

This correspondence is a status report concerning the preparations associated with processing transuranic bearing oxide at the X-705 Oxide Conversion Facility. One area of discussion will include the implementation status of the Department of Energy (DOE) recommendations that were set forth in your letter of November 28, 1977, on this subject. In addition, a status of other activities that were considered necessary for Goodyear Atomic Corporation (GAT) compliance with the DOE containment philosophy is included. Miscellaneous activities, requiring significant expenditure, that are considered essential to the transuranic model run are also discussed. It was also deemed appropriate to include an operating specification as an attachment that had recently been prepared in association with the new containment inducing activities. A review of this operating specification should provide DOE with an insight into GAT operating philosophy, and permit modification where necessary.

--The recommendations included in the DOE letter of November 28, 1977, were discussed at length with Dick Smith of ORO during his recent visit at the Portsmouth Site. In some cases, the recommendations were modified with Mr. Smith's approval. The recommendations are paraphrased for your convenience and listed below, along with the associated implementation status.

APPROVED FOR RELEASE BY:

RECOMMENDATION 1: MODIFY EXISTING PROCEDURE FOR REMOVAL OF PG FILTERS

Status: This recommendation was modified to permit the removal of the PG filter housing cap before the temporary secondary containment system is installed on the filter housing. The modification was considered necessary if the equipment removal and subsequent brushing down operations were to be carried out, and was justified by the fact that removal of the cap exposed the clean side of the filter. An examination of the system indicates that the gaseous UF_6 from the flame tower enters the side of the cylindrical PG filter housing where it is diverted by a shield to the bottom of the housing. At the bottom of the housing, the flow is inside the shield, up through the multi-tube sintered metal filter and out the piping in the cap; therefore, the removal of the cap exposes only the clean side of the filter.

The requirement of fastening the secondary containment system to the PG filter housing required a modification to the housing support system which has been carried out. The original support system included support rods anchored near the top of the glove box and extending vertically down through the extended flange on the filter housing. The rods were threaded for vertical adjustment and two rods were installed on each of the three housings. The extension of the rods through the flange precluded the satisfactory fastening of the secondary containment system on the housing. The pertinent modification included the relocation of the support rods and the support brackets. The modifications took place inside the Tower Room lower glove box, necessitating the removal of the Plexiglas on the north side, extensive decontamination procedures, and requiring that the proper personal protective equipment, including air supplied hoods, be worn for all pertinent operations.

The secondary containment system will be in the form of a poly vinyl plastic tube approximately 25 feet in length that will be fastened to the filter housing. The 54 inch PG filter will be removed from the housing into the plastic tube which will be sealed at both ends and then cut at the lower end, The 54 inch PG filter shield will then be removed in a similar manner. Following the removal of the shield, a radial filter housing cleaning brush approximately 7 feet in length will be inserted into the containment system. When the housing has been brushed down, the brush will be removed by again sealing the tube top

and bottom, encompassing the brush, and then cutting the lower end. All items removed from the housing will be contained in plastic until the wet cleaning process commences. The remainder of the tube fastened to the filter housing will remain in place until the clean shield and filter have been installed in-the housing.

Procurement of the plastic tubing material has been initiated.

RECOMMENDATION 2: DEVELOP A METHOD OF EMPTYING 'THE PG FILTER ASH POTS INSIDE THE GLOVE BOX REMOTELY FROM OUTSIDE THE GLOVE BOX

Status: The implementation of this recommendation has been referred to GAT Engineering for a determination of the best 'method. Three methods in particular have been proposed by GAT Uranium Operations for Engineering evaluation. The methods are as follows:

A) The fabrication of additional filter ash pots with attachable lids seems to be the best short-term solution to this problem. Normally, the ash pots require emptying only at month's end during inventory procedures; therefore, the addition of 6 ash pots should be more than adequate for carrying out a transuranic model run. This method would include removing the ash pot and contained material from the glove box for permanent or temporary storage. Transfer of the contained material to another container for permanent storage could best be carried out in an auxiliary glove box that is not encumbered with the height and space limitations of the lower tower glove box.

B) The installation in the glove box of a remotely operated mechanical lifting fixture for inverting the ash pot for emptying has been proposed as a permanent solution to the problem. In conjunction with the lifting fixture, a device will be required to hold the receiving can in an upright position. A modification to this method could include provisions for fastening the receiving can to ash pot, mouth to mouth; then, when the ash pot is inverted, the contained material could be transferred directly into the receiving container.

C) A vacuum system that could be dedicated to emptying the PG filter ash pots is considered a more attractive long-term solution to this problem. Prior experience gained in handling this material with a vacuum system indicated that its light fluffy composition was not conducive to vacuum transfer. However, this conclusion was not measured against the new stringent containment philosophy. Therefore, it will be re-evaluated during the next operation of the facility.

In conjunction with either method A) or B) above, a remotely operated lifting device must be provided for removing the ash pots from the dollies. The ash pots weigh approximately 70 pounds precluding their manual removal by use of the glove ports (i.e., the pots cannot be lifted out of the dollies by-hand).

This recommendation also required an air lock at the lower tower glove box for personnel access. Although this requirement was specifically for manually handling the ash pots, it is assumed that an air lock is required for glove box entry for any reason; therefore, since any of several maintenance problems could require glove box entry, this recommendation should be implemented before the transuranic model run. The implementation has been referred to GAT Engineering for a determination of the best method. GAT Uranium Operations requested evaluation of both a temporary (e.g., constructed of plastic) and a permanent type air lock.

RECOMMENDATION 3: USE BAG IN/BAG OUT PROCEDURES FOR EQUIPMENT REMOVAL FROM THE GLOVE BOX

Status: This recommendation will be implemented. An adequate supply of plastic bagging material is presently on hand for carrying out this requirement. In conjunction with the bag in/bag out procedures the personnel access air lock will be used for the removal of large equipment. A small air *lock* will be installed for the removal of small equipment. Tools required for maintenance will be dedicated for use in the glove box.

RECOMMENDATION 4: EVALUATE HEALTH PHYSICS ADEQUACY OF CLEANING THE PG FILTERS AT THE "E" AREA HAND TABLES, AND EVALUATE THE FEASIBILITY OF INSTALLING A CLEANING TABLE IN THE TOWER ROOM

Status: The Special Nuclear Materials Safeguards, Project will provide a cleaning hand table at Oxide Conversion in FY-80.

The provision of a temporary table (i.e., table, storage recirculating pump and ventilation) at this facility as an interim measure has been estimated to require an expenditure of approximately $100,000; therefore, it is not considered cost effective for the trial run.

The adequacy of cleaning the PG filters and other contaminated Oxide Conversion equipment at the "E" area hand tables was discussed with Dick Smith of ORO. As a result of this discussion, it was decided that a temporary containment enclosure encompassing the "E" area hand tables would suffice. This enclosure would cover top and sides to table level. This concept has been referred to GAT Engineering for a determination of the best method.

The solution used for cleaning will be transferred to poly bottles for storage. A means for final disposition of this solution has not been determined.

RECOMMENDATION 5: EMPLOYEES SHOULD RECEIVE HANDS-ON PRACTICE BEFORE PERFORMING ROUTINE MAINTENANCE SUCH AS FILTER CHANGE

Status: This recommendation will be implemented. Operating specifications will be available and personnel required to carry out routine maintenance procedures will have hands-on experience prior to the transuranic model run.

RECOMMENDATION 6: SEAL ALL HOLES IN THE GLOVE BOX

Status: This- recommendation has been implemented as far as a visual inspection is concerned, but a method of assuring glove box integrity needs to be developed. One method that has been considered includes the installation of a halogen detector in the glove box vent and the application of freon to the exterior of the box.

RECOMMENDATION 7: REPLACE ALL GLOVE BOX GLOVES AND G-RINGS

Status: All glove box gloves at the Oxide Conversion Facility were recently visually inspected for integrity. As a result

-of the inspection; approximately 40 percent of the 85 gloves at this facility were replaced. A procedure is now in effect with-an associated check sheet that requires a daily visual. inspection of the gloves and glove box in general while the . facility is in operation.

RECOMMENDATION 8: DECONTAMINATE THE TOWER ROOM TO THE LOWEST LEVELS PRACTICABLE.

Status: The 'Oxide Conversion Facility was decontaminated following October operations. The Health Physics and Iridustrial Hygiene Department surveyed the facility and Chemical Operations personnel are currently decontaminating high level areas again. The Health Physics Department has been requested to schedule surveying of the Oxide Conversion Facility on a monthly and/or "as needed" basis. Decontamination of the facility, particularly the Tower Room, will continue until levels are as low as practical.

RECOMMENDATION 9: ESTABLISH LIMITS FOR CONTAMINATION AND AIRBORNE ACTIVITY

Status: The limits for contamination and airborne activity have been established by the GAT Health Physics and Industrial Hygiene Department. The limits were established using a comb-ination of transuranic and uranium limits (i.e., experience indicates that the transuranics are likely to accumulate in some areas more than others), Dick Smith was provided with a, copy of these limits for his review.

Other activities associated with the determination of personnel exposure include the transuranic analysis of urine samples and the In-Vivo Body Counter Scan. However, both of these activities will provide information only after the fact for documentation and future reference. The urine samples must be forwarded to Oak Ridge National Laboratory for analysis and the projected elapsed time for receipt of the results indicates that they cannot be used as control media. The costs and time associated with scanning all affected personnel with the In-Vivo Counter -dictate that scheduling personnel for the In-Vivo be on a one time basis following the model run (assuming pre-operation counts have been conducted as a regular part of the program). The total cost for urine and In-Vivo analysis has been estimated at $6,000.

GAT Uranium Operations has taken a closer look at the Oxide Conversion Facility for other areas that may require modifications, Problem areas were predicted, in part, on the basis of the continuous air monitoring results correlated with particular maintenance operations following the October run. Chemical Operations had changed the monitoring cards in some areas at an interval of 2 hours in order to develop this correlation. Dick Smith has been provided with this information.

AREAS NOT COVERED BY DOE THAT MAY REQUIRE EQUIPMENT MODIFICATION ARE:

1. The MgF_2 Traps: The MgF_2 traps are located in "H" area, a large open room which is not conducive to containment. Samples taken of trapping materials used in association with prior "runs" of transuranic bearing oxides at Oxide Conversion indicated that the transuranics tend to accumulate in the MgF_2 traps. Therefore, stringent measures to assure containment should be taken in conjunction with the removal of MgF_2 pellets. Current plans call for the removal of the pellets at the conclusion of each month's "run". At the end of the October run, the vacuum sweeper discharge was exhausted to the Oxide Conversion Vacuum System as a means of limiting airborne contamination.- However, limited amounts of the trapping materials did fall to the floor creating a containment problem. The provision of a temporary type containment enclosure has been proposed as a solution to the problem. GAT Engineering has been requested to evaluate this proposal.

2. Roughing Filter Removal: Multi-tube sintered metal roughing filters are located in the glove box exhaust systems. The removal of the filters for cleaning purposesrequires opening the glove box. The filter in the lower tower glove box is normally changed 3 times each 24-hour period while the facility is in operation. Further complicating any bagging procedure is the fact that the dirty side of the filter is exposed in opening the glove box. This problem can be corrected by locating the filters on the outside of the glove boxes with the clean side of the filter. exposed *for* removal. GAT Engineering has been requested to evaluate this concept.

3. *Tower* Reaming: At the end of each month's run, the tower is *reamed to remove any* accumulated *material.* The reaming. operation is carried out as follows:

A) A cover plate at floor level in "H" area is' removed *for* access to the upper tower glove box.

B) The drive motor, disperser, T-section, and feed screw are removed from the upper tower.

C) The auger used for reaming is passed by means of 'its flexible drive connector down through the floor in "H" area into the upper tower glove box *where* it*is* fed into the top of the tower.

D) The drive motor for the auger located in "H" area is turned on.

E) The tower is reamed and the auger is *removed* from the upper tower glove box into "H" area.

Prior sampling analysis results indicates that the reaming operation contributes significantly to airborne contamination. A temporary containment enclosure in "H" area at the upper; tower glove box access plate has been proposed. This proposal has been referred to GAT Engineering for evaluation.

Particular monitoring activities associated with the transuranic -*model run will require a significant monetary expenditure.

GAT is committed to report to DOE-ORO an experimental evaluation of the exposure-release concentration models and the results of the system transuranic elements mass balance in conjunction with the transuranic model run. Approximately 600 samples must be analyzed for transuranic concentration for the above commitment to be carried out. If both soluble and insoluble transuranics are analyzed on each sample, a total of 4,000 man-hours will be required to analyze the 600 samples (as estimated by the GAT Chemical Analysis Group), This figure is based on the assumption that all samples would have to be analyzed. It is possible that a preliminary check for total, activity might eliminate the need *for* the extensive laboratory work for transuranic analyses on some of the samples.

Essentially all the time required for analysis would have to be overtime, since the GAT Radiochemistry Laboratory cannot handle its present workload without a small amount of overtime. The elapsed time to do the work is estimated at 5 to 6 months. This limitation is caused by the fact that only a few people are trained to do this type of work, and by the limited capacity of the counting equipment necessary *for* completing the work.

The sampling analyses labor costs will total approximately $50,000 (excluding overhead).,

DOE has indicated that around the clock coverage should be provided by the GAT Health Physics and Industrial Hygiene Department while the Oxide Conversion Facility is in operation, and when the follow-up maintenance procedures are being carried out. The Health Physics representatives are needed to take samples, and surveys, and to monitor maintenance-type operations for Health Physics adequacy. Roughly 600 man hours of overtime for surveyors and 200 hours of staff time will be required for this coverage at a total cost of approximately $17,000 (including overhead). In addition, to provide this coverage, surveyors will have to work 3.6 hours a day, 5 days a week, for the duration of the model run (it is highly unlikely that this schedule can be maintained). The alternative to covering this operation without overtime allows only one surveyor available to carry out the routine Health Physics functions for the rest of-the plant. Under normal conditions, the Health Physics Department has difficulty in accommodating the great number of requests for service they receive in a timely manner; therefore, it is indicated that at least one additional surveyor is needed before the model run.

The Oxide Conversion Facility is currently equipped with alpha indicating monitors (AIM's) to provide a visual indication of radioactive airborne contamination. However, the performance of these instruments ha's been less than satisfactory. The AIM's require maintenance at such frequent intervals that personnel working in the Oxide Conversion Area have little confidence in the monitors, and have a tendency to disregard the instruments entirely. In addition, although GAT Instrument Maintenance personnel have extended their cooperation in servicing the AIM's, there have been times when monitors have not been readily available due to an inadequate supply of standbys.

GAT Uranium Operations have actively been seeking a solution to this problem. A new airborne monitor, Eberline Alpha III Aerosol, at a cost of $1,600 each, has been recommended for this application by the GAT Health Physics Department. Six of these instruments at a total cost of $9,600 should be procured for use at the Oxide Conversion Facility- before the transuranic model run.

The attached Operating Specification "DRAFT" was prepared by Uranium Operations. This "DRAFT" has not had the extensive review that specifications normally undergo before being "approved". However, it should be reviewed so that any necessary modification in containment philosophy can be incorporated in other specifications that will be prepared in association with the transuranic model run.

Efforts are being made to expedite the evaluations and cost estimates of the projects discussed. GAT plans to proceed with the temporary type *or* short term modifications set forth in this letter unless advised otherwise. The scope and costs involved for sampling and monitoring the model run are significant and should be reassessed from d-benefit-cost view point.

Current GAT plans pertaining to the transuranic model run include the following in chronological order *for* implementation:

1. *Carrying* out containment-type modifications, (temporary and short term)
2. Operating the facility without transuranics.
3. Identifying and eliminating any additional exposure causing operations by proper modification.
4. Requesting a thorough examination of the facility and collected data (i.e., pertinent to containment) by Dick Smith.
5. Process transuranics after approval by Dick Smith.

Very truly yours,

GOODYEAR ATOMIC CORPORATION

N. H. Hurt
General Manager

JPV:tlf

Attachment

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